Summary of Sustainable Forestry Research

FY 2005

Michigan Department of Natural Resources

Purpose and Use of this Report

The Michigan Department of Natural Resources (DNR) supports research projects to ensure sustainable management of Michigan's state forest lands. This document summarizes those projects in place during the fiscal year 2005 (October 1, 2004 - September 30, 2005). This document also fulfills the requirement of Forest Certification Work Instruction 5.1 "Coordinated Natural Resource Management Research" for the annual summary of research activities within forested landscapes. This report should be used to document the DNR commitment to sustainable forestry research and to inform discussion on research needs and collaboration opportunities among the DNR Divisions.

Research Summaries

Research is administered and supported differently in each DNR Division. The Wildlife Division and Fisheries Division administer all research activities through their respective research sections. These Divisions also have a significant portion of their research efforts funded by a variety of federal grants that have annual reporting requirements. Forest, Mineral and Fire Management Division (FMFMD) does not have a dedicated research section; administration and support of research occurs through each program area.

The summary of research projects are organized into tables by DNR Division. The different table structures for each Division are due to the difference in how research is administered. Each table is organized by the themes of sustainable forestry based upon the objectives of the study. The theme names provide a logical link to sustainable forestry and allow the reader to assess the breadth and depth of the DNR's research programs. One study could potentially fit into multiple groups. For simplicity sake, studies are listed in only one group. The group names are:

Ecological Processes;
Human Dimensions;
Chemical Use;
Wildlife Management;
Fisheries Management;
Environmental Protection;
Biological Diversity;
and Social Economic.

Table 1. Wildlife Division Research Projects.

Title	Duration
Ecological Process	
Coastal Wetlands in MI: 1) Effect of isolation on *Phragmites communis* expansion and use by wetland birds, 2) Effect of wetland isolation via dike construction on avian communities using Great Lakes wetlands (Brown/MNFI)	4 years
Evaluating the Ecological Contributions of State Game and Wildlife Areas in the Context of a Human Distrubed Landscape (Millenbah/MSU	4 years
Importance of Coarse Woody Debris to Forest Songbirds (Brown/MNFI)	2 years
Human Dimensions	
Improving the Quality and Impact of Wildlife Management Outreach in Michigan (Riley/MSU)	3 years
Environmental Factors Affecting Frequency and Rates of Deer-Vehicle Collisions in Southern Michigan (Riley/MSU)	2 years
Assessment of Wildlife Division Public Involvement Processes and Opportunities for Improvement (Peyton/MSU)	2 years
Adaptive Impact Management: Improving Decision-Making Capacity for Wildlife Managers in Michigan (Riley/MSU)	3 years
Assess Recreational Use of State Game and Wildlife Areas (Nelson/MSU)	3 years
Enhancing Conservation of Eastern Massasauga Rattlesnake in Michigan: Human Dimensions of Rare Reptile Management (Riley/MSU)	3 years
Development and Evaluation of a Citizen Conservationist Program in Southern Michigan (Dann/MSU)	3 years
Chemical Use	
Impact of Purple Loosestrife Biological Control on Wetland Communities in Michigan (Landis/MSU	3 years
Evaluating the Potential for Biological Control of Garlic Mustard in Michigan (Landis/MSU)	2 years
Wildlife Management	
Quantifying Elk Movement Patterns, Social Interactions with White-tailed Deer, and Estimating the Population Size and Demographics in Michigan (Campa/MSU)	4 years
Moose Population Dynamics and Survey Techniques (Winterstein/MSU)	4 years
Gray Wolf Population Modeling and Estimation Techniques (Peterson/MTU)	3 years
Landscape Ecology of White-tailed Deer in Agro-Forest Ecosystems: A Cooperative Approach to Support Management (Multi-State Project, Michigan Component) (Campa/MSU)	3 years

Assessment of Furbearer Population Size and Effects of Landscape Features on Distribution and Population Structure (Scribner/MSU)	3 years
Planning for the Management of Wolves in the UP of Michigan (Peyton/MSU)	2 years
Evaluation of the Statistical Properties of Abundance Estimators Using Sightability Models (Drummer/MTU)	1 year
Monitoring Bobcats in the Northern Lower Peninsula of Michigan (T. Gehring/CMU)	2 years
Genetic Evaluation on Marten in Michigan's Northern Lower Peninsula (Swanson/CMU)	2 years
Winter use by White-tailed Deer of Remnant Hemlock Stands in the Western Upper Peninsula (Webster/MTU)	3 years
Developing a Sharp-tailed Grouse Monitoring Program in the Eastern Upper Peninsula (Drummer/MTU)	3 years
Habitat Requirement of the Endangered Indiana Bat in Southern Michigan: A Comprehensive Analysis (Kurta/ EMU)	3 years
Locating Important Habitat Types Along West Michigan Shorelines and Dunes: A Novel Approach to Predictive Management for Threatened and Endangered Species (Millenbah/MSU)	4 years
Modeling Habitat Ecology and Population Viabilityof the Eastern Massasauga Rattlesnake in Southwestern Lower Michigan (Millenbah/MSU)	3 years
A Wildlife Habitat Tool for the IFMAP Decision Support Environment (Maurer/MSU)	2 years
MIWILD - Wildlife and Their Associated Habitats in Michigan (Thomasma/GVSU)	2 years
Bats & Mines: Further Exploration and Post-gating Monitoring (Kurta/EMU)	2 years
Adult Dispersal, Habitat Quality, Identification of Management Triggers, and Development of Practical Monitoring Techniques for the Karner Blue Butterfly (Dunn/GVSU)	2 years
Massasuaga Ecology and Response to Construction and Restoration Efforts (Kingsbury/IPFW)	2 years
Environmental Protection	
Avian Collisions with Communication Towers: A Quantification of the Associated Tower Variables (J. Gehring/CMU)	1 year
Biological Diversity	
Modeling the Cumulative Effects of Aspen Management Practices on Wildlife Species, Communities, and Habitat Suitability at Multiple Spatial Scales (Campa/MSU)	4 years
Social and Economic	
Michigan Deer Hunters' Mobility, Demand for Hunting Sites and Economic Values (Lupi/MSU)	2 years

Table 2. Forest, Mineral, and Fire Management Division Research Projects.

Research Project Title	Project Summary
Ecological Processes	
Michigan Natural Features Inventory	Natural Features Inventory of the Michigan State Forests & Other Studies of Natural Features
Human Dimensions	
Michigan State University	Non-Industrial Forest Landowner Motivations for Owning Land (Phase 2)
Chemical Use	
Forest Management	
Forest Fire Experiment Station	Design, develop, and build prototype and operational equipment units for mechanized forest fire fighting
Roscommon Equipment Center	Design and develop specialized equipment for forest fire fighting
Michigan Tree Improvement Center	Funding for center to do Tree Improvement Studies and implement nursery practices to improve quality of tree seedlings produced in Michigan State Forest Nurseries
Wyman Nursery Improvement	Improvements of production of nursery stock and seedlings
Forest Inventory Analysis	Conduct the re-measurement of the FIA plots for Michigan
Wildlife Management	
PERM Forester	Support of a PERM Research Forester and forest-based projects that relate to wildlife habitat improvements
Fisheries Management	
Environmental Protection	
Oak Wilt Detection Survey	Oak Wilt Sample Analysis for delimitation of infected areas
Beech Bark Disease Monitoring	To develop and implement a statewide beech bark disease monitoring and impact analysis system
Beech Bark Disease	Development of a statewide Beech Bark Disease Monitoring and Impact Analysis Plot Network.

Table 3. Fisheries Division Research Projects

Title	Duration
Ecological Process	
Managing Michigan Lakes: Evaluating Effects of Watersheds and Habitat Perturbation on Lake Resources (Bremigan, MSU)	3 years
The importance of trophic interactions for salmonine fisheries of the Great Lakes (Bence, MSU)	4 years
Developing an ecological regionalization for Lake Michigan (Rutherford, U of M)	2 years
Developing a lake classification system for Michigan inland lakes (Soranno, MSU)	2 years
Streams habitat status and trends (Rutherford, Will, U of M)	3 years
Ecological Inventory of Inland Lakes (Wehrly, U of M)	3 years
Effects of Piscirickettsia infection on the muskellunge population of Lake St. Clair (Thomas, Faisal, MSU)	3 years
Factors affecting Lake Sturgeon Recruitment: A model system for species recovery in Michigan waters of the Great Lakes (Scribner, MSU)	4 years
Evaluation of trends in growth and relative abundance of Lake Whitefish in Lake Michigan (Galarowicz, CMU)	3 years
Evaluating movements of juvenile lake sturgeon (Diana, U of M)	2 years
Human Dimensions	
Fisheries Stewardship and Heritage Outreach/Research (SHOR) Initiative (Dann, MSU)	3 years
Chemical Use	
Wildlife Management	
Development of a GIS for Inventory, Classification, and Management of Non-Game Wildlife in Great Lakes Waters (Rutherford, U of M)	5 years
Dev. Of Comprehensive State Aquatic Wildlife Plan (Rutherford, Hay, U of M)	3 years
Fisheries Management	
Using population and community dynamic models and quantitative fisheries analysis to promote improved fisheries management in the Great Lakes (Bence, MSU)	4 years
Linking fish population models with aquatic habitat conditions to enhance lake and stream fishery management in Michigan (Hayes, MSU)	4 years
Developing decision tools for inland lake management through field sampling and statistical models linking lakes to landscape context (Bremigan, MSU)	4 years
Development and Implementation of a Fish Health Initiative for Michigan Inland and Great Lakes Fisheries (Faisal, MSU)	5 years
Quantitative Support for Inter-Juris Fisheries Management (Bence, MSU)	5 years
Inland Creel Surveys (Rutherford, Lockwood, U of M)	2 years
Environmental Protection	
Impact of removal of Stronach Dam, Manistee County (Hayes, MSU)	3 years
Tittabawassee River Assessment (Rutherford, Lockwood, U of M)	2 years
Implications of Lakeshore development for fishery resources in Michigan (Hayes, MSU)	4 years
Biodiversity	
Development and Implementation of Conservation Genetic Initiatives for Michigan inland and Great Lakes Fisheries (Scribner, MSU)	4 years

Resource inventory support for inland lakes (Rutherford, Lockwood, U of M)	3 years
Improving fishery stock assessments in the Great Lakes (Bence, MSU)	4 years
Design, analysis, and implementation of aquatic resource inventory in Michigan (Hayes, MSU)	4 years
Comprehensive databases for Great Lakes (Alderstein, U of M)	3 years
Classification and analysis of Great Lakes fisheries habitats (Rutherford, U of M)	5 years
The Digital Water Atlas (DWA) and Resource Guide for Michigan's Inland Waters (Breck, Szabo, Uof M)	5 years
Effects of exploitation and fisheries management on genetic diversity of fish stocks in inland and Great Lakes waters of Michigan (Scribner, MSU)	4 years
Social Economic	
Using economic models and quantitative human dimensions analysis to promote improved fisheries management in the Great Lakes ecosystem (Lupi, MSU)	4 years

Integration and Use of Research in the DNR

Research that supports sustainable forestry in the DNR occurs through a variety of mechanisms. The DNR supports a large number of research projects contracted through multiple universities within the state. The DNR also supports faculty positions through their DNR's Partners in Ecosystem Management and Research Program. The DNR also employs it's own research and monitoring staff in FMFMD, Wildlife Division, and Fisheries Division.

Michigan DNR research programs cover the entire breadth and depth of sustainable forestry. While each Division uses a different array of means to communicate research findings, the research programs are well integrated with the operations of the DNR and are providing useful information to support improvements in business practices. Division in-service trainings, specialist meetings, and ongoing field and program communications are examples of the means used to convey research information to DNR personnel. For more information about specific research projects listed in the tables above, interested parties should contact the research coordinator for that Division. Table 4 list the research coordinator for each Division.

Table 4. DNR Research Coordinators.

DNR Division	Coordinator	Phone number	Email
FMFMD	Ronald Murray	517-335-3353	MurrayR@Michigan.gov
Wildlife	Patrick Lederle	517-373-9338	LederleP@Michigan.gov
Fisheries	Paul Seelbach	734-663-3554	SeelbacP@Michigan.gov